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CLAIM

- 1) The cleaning agent with which it consists of water, and the propylene glycol alkyl ether which dissolves only at a rate below water and 50 capacity % by 60 degrees C and propylene glycol alkyl ether (2) (3) water which may dissolve at a rate of arbitration at 60 degree C, and these come to form a homogeneity phase.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the cleaning agent which washes the dirt adhering to the fats and oils adhering to metal components etc., electronic parts, etc., such as flux and a fingerprint.

[0002]

[Description of the Prior Art] The chlorofluocarbon system solvent or the halogen system solvent has been used for cleaning washing of washed objects, such as metal components, electronic parts, and semi-conductor components, from the reasons of that there is no danger of ignition, excelling in the detergency by incombustibility. However, it is anxious about the destructive problem of earth environment, and the effect on the body, and changeover to a surfactant, the drainage system cleaning agent which uses alkali as a principal component, a hydrocarbon system cleaning agent, an alcoholic system cleaning agent, or the semi- drainage system cleaning agent that distributed the third petroleum hydrocarbon in water using the surfactant is progressing recently.

[0003]

[Problem(s) to be Solved by the Invention] However, in the cleaning method using a drainage system cleaning agent, there is a problem of that a lot of waste water with detergency inadequate [with high fizz] must be processed, corroding a washed object. Each of hydrocarbon system cleaning agents and alcoholic system cleaning agents is inflammability, has the high flash point and has the danger of ignition. Moreover, when phase separation of the semi- drainage system cleaning agent is carried out, it has the fault with inflammability of that unevenness comes out, having to carry out a lot of waste water treatment to detergency.

[0004] The cleaning agent which uses the alkylene glycol monophenyl ether, a glycol ether system solvent, and a surfactant as a principal component is proposed by JP, 5-51599, A. However, since sufficient detergency is not acquired but this cleaning agent

contains the non-volatile constituent, it remains in a washed object and has a possibility of affecting it. Moreover, since it has growth and the influence on reproduction toxicity and threshold limit value is being restricted severely, the compound of an ethylene glycol alkyl ether system is not desirable.

[0005]

[Means for Solving the Problem] this invention person came research in piles about the washing capacity of various kinds of propylene glycol alkyl ether on the basis of toxicity using propylene glycol alkyl ether with safety high low more compared with ethylene glycol alkyl ether. Consequently, although there was no inflammability when it has inflammability and the propylene glycol alkyl ether which dissolves at a rate of water and arbitration was used as mixture with water on the other hand, although the propylene glycol alkyl ether which is hard to dissolve in water had high washing capacity, it turned out that a problem is in washing capacity.

[0006] Then, although this invention persons were excellent in the above-mentioned washing capacity, they came to develop the cleaning agent which was excellent in washing capacity by mixing water with the propylene glycol alkyl ether in which more sufficient amount to abolish inflammability does not dissolve water, and its propylene glycol alkyl ether dissolved at a rate of water and arbitration although it does not have sufficient washing capacity if independent further.

[0007] That is, this invention consists of water, and the propylene glycol alkyl ether which dissolves only at a rate below water and 50 capacity % by 60 degrees C and propylene glycol alkyl ether (2) (3) water which may dissolve at a rate of arbitration at (1) 60 degree C, and these are the cleaning agents which come to form a homogeneity phase.

[0008] The propylene glycol alkyl ether which is the above-mentioned component of (1) is dissolved at a rate of water and arbitration in 60 degrees C. This component has the operation which raises the compatibility of the component of (2) mentioned later, and the water of (3). As such propylene glycol alkyl ether, propylene glycol monomethyl ether, dipropylene glycol monomethyl ether, tripropylene glycol monomethyl ether, the propylene glycol monoethyl ether, the dipropylene glycol monoethyl ether, propylene glycol wood ether, etc. can be mentioned.

[0009] Next, the propylene glycol alkyl ether which is the component of (2) is dissolved only at a rate below water and 50 capacity % in 60 degrees C. This component is a component which mainly demonstrates washing capacity. As such propylene glycol alkyl ether, the propylene glycol monopropyl ether, the propylene glycol monobutyl ether, the dipropylene glycol monobutyl ether, the tripropylene glycol monobutyl ether, dipropylene glycol wood ether, tripropylene glycol wood ether, dipropylene glycol diethylether, dipropylene glycol dibutyl ether, etc. can be mentioned.

[0010] the above-mentioned propylene glycol alkyl ether of (1) and (2) is independent -- or two or more kinds can be used, combining.

[0011] If the detergency of an oil content and the thing which can be suitably used in this invention in respect of drying are illustrated among the component of these (1), and the component of (2), as a component of (1), dipropylene glycol monomethyl ether, the propylene glycol monoethyl ether, and propylene glycol wood ether can be mentioned, and the propylene glycol monobutyl ether, the dipropylene glycol monobutyl ether, and dipropylene glycol wood ether can be mentioned as a component of (2).

[0012] The component of (3) of the cleaning agent of this invention is water. Water has the operation which reduces the inflammability of the above-mentioned component of (1), and the component of (2).

[0013] When the above-mentioned component of (1), the component of (2), and the component of (3) are mixed, there are a field which forms a homogeneity phase by the presentation ratio of each [these] component, and a field divided into a two phase. The phase diagram of the three-component system of the dipropylene glycol monomethyl ether which is the component of (1), the propylene glycol monobutyl ether which is the component of (2), and the water which is the component of (3) was shown in drawing 1. The field C in drawing 1 is a field in which three components do not dissolve in homogeneity but form the two phase of an oil phase and the aqueous phase. Field A and Field B are fields which three components dissolve and form a homogeneity phase. In this invention, although any cleaning agent of a presentation of the above-mentioned field A and Field B is usable, since the amounts of water are below 20 capacity % and little presentation, Field A has inflammability. Therefore, the cleaning agent of a presentation of the field B which does not have inflammability can be suitably used by this invention.

[0014] As described above, the cleaning agent of this invention is used in the condition that the component of (1), (2), and (3) forms a homogeneity phase. Although the presentation ratio of each above mentioned component cannot generally be ***** (ed) since some differences are in the solubility to water according to the class of each component, it serves as the in general following presentation. That is, as for the component of (1), it is desirable that it is 20 - 70 capacity %, and it is desirable that it is further 25 - 50 capacity %. As for the component of (2), it is desirable that it is 10 - 60 capacity %, and it is desirable that it is further 20 - 50 capacity %. The component of (3) is suitable in order that that it is 20 - 80 capacity % may make a cleaning agent nonflammability. In order to obtain a high detergency, the higher one of the concentration of the component of (2) is desirable, but if it is made the high concentration of the remainder, in order to carry out phase separation, it is used by the density range which forms a homogeneity phase.

[0015] The washing approach using the cleaning agent of this invention can adopt a well-known approach that there is no limit in any way. For example, a cleaning agent is [a shower the approach of carrying out a spray, etc.] employable as the approach immersed into a cleaning agent in the washed object to which fats and oils adhered, and the washed object to which fats and oils adhered. It is effective if means, such as ultrasonic cleaning, a splash, and churning, are used together at this time.

[0016] It does not dissolve in a cleaning agent, but most oils removed from the washed object turn into floated oil or a precipitation oil, and it is separated from a cleaning agent. For this reason, it is possible by processing the cleaning agent after using it for washing with an oil separator etc. to separate an oil easily. Moreover, it is not polluted by the oil but the collected cleaning agent holds washing capacity high for a long period of time. Since the oil concentration which melts into a cleaning agent influences the washing capacity of a washed object, the usual hydrocarbon system solvent, a halogen system solvent, and the cleaning agent that demonstrates high washing capacity by dissolving water and an incompatible oil like propylene glycol alkyl ether need to separate a cleaning agent and an oil by distillation. However, the cleaning agent of this invention does not have the need, and can maintain high washing capacity.

[0017] although the cleaning agent of this invention comes out not to mention being applicable to the washing tub aiming at cleaning, it is applicable also to the rinse tub aiming at a rinse following a washing tub. moreover -- even if the cleaning agent of this invention is dried adhered to a washed object -- a washed object -- in any way -- an adverse effect -- giving -- RU -- it dries easily without things. Moreover, when using

water for a rinse of the washed object, the rinse water of a large quantity is not needed like a drainage system cleaning agent or a semi- drainage system cleaning agent. [0018]

[Effect of the Invention] In order that the cleaning agent of this invention may not dissolve the oil content which was rich in the washing capacity of the oil content of a washed object, and was washed out from the washed object, separation of the oil content from a cleaning agent is easy for it, and its liquid life of a cleaning agent is also long. Moreover, by choosing the loadings of water suitably, it can consider as nonflammability, and an explosion-proof facility like the washing station using a hydrocarbon system cleaning agent or an alcoholic system cleaning agent is not needed, but it can be used for insurance.

[0019]

[Example] Although an example is given in order to explain this invention concretely, this invention is not limited to these examples.

[0020] The thing which made an example and about 50mg /of example marketing machine oil of a comparison adhere to a 50mmx80mmx1mm aluminum plate a sheet was made into the test piece, and it washed using cleaning agent 1L which makes the homogeneity phase of the presentation shown in a table 1. Washing performed the test piece by being immersed for 2 minutes into the cleaning agent of the washing temperature shown in a table 1. The test piece was pulled up after washing and it rinsed for 1 minute with the 20-degree C stream, and 80 degrees C estimated the desiccation back for 20 minutes, and the weight method estimated the oil-content elimination factor.

[0021] After repeating the above-mentioned actuation 100 times, the floated oil in a cleaning agent was removed and the oil content which remains in a cleaning agent was analyzed with n-hexane extraction method. 2nd washing was performed on the same conditions as the above using this cleaning agent, and the oil-content elimination factor at that time was shown in a table 1.

[0022] Furthermore, it is JIS about measurement of the flash point of a cleaning agent. K-2265 It measured by the flash point measurement examining method of a crude oil and a petroleum product, and wrote together to a table 1.

[0023] In addition, the semantics of the code in a table is as follows. The numeric value in () is the solubility to 60-degree C water.

[0024]

Component DPGM of (1) : Dipropylene glycol monomethyl ether TPGM :
Tripropylene glycol monomethyl ether PGE : Propylene glycol monoethyl ether PGDM : Propylene glycol wood ether PGM : Component of propylene glycol monomethyl ether (2) (the inside of () is the solubility to 60-degree C water.)
PGP : propylene glycol monopropyl ether (28 capacity %)
PGB : propylene glycol monobutyl ether (6 capacity %)
TPGDM : tripropylene glycol wood ether (24 capacity %)
DPGDE : dipropylene glycol diethylether (5 capacity %)
DPGB : dipropylene glycol monobutyl ether (5 capacity %)
DPGDM : dipropylene glycol wood ether (36 capacity %)
Other components EGPh : Ethylene glycol monophenyl ether (2 capacity %)

[0025]

[A table 1]